



Dart Hawkesbury
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D3391-021

Job Sheet 168617-B



Part No: D3391-021

Job Qty: 1 ea

Part Name: Fwd Tube Assembly



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 11/20/17

Job Tracking No:

Due Date: 11/30/17

Created By: Linda Lacelle

Type: SOLD

Description:

Note: DWG REV J SHEETS 4,5 IPP A 05.09.13 New issue KJ/JLM IPP B IPP C IPP D 07.03.13 rev F dwg EC IPP E 07.11.07 revG dwg ecn1053P EC verified by: DD IPP Rev:f ECN 1056 07-11-12 DD verified by: EC IPP Rev:G 08-09-08 new process (ecn 08-510) DD verified by:EC IPP Rev:H 08-09-10 revH as per dwg DD verified by:EC IPP Rev I 09.02.02 added hardware EC verified by: DD IPP Rev:J 11.11.14 AS PER REV.I DD verified by:JLM

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup	Run	Workcenter / Supplier	Lead Time	
					hrs	Hrs			
90	Start up Operation	1 Ea	11/29/17	11/29/17	0.00	0.00	Start Up Skidtubes		
100	Skidtubes	1 pcs	11/29/17	11/29/17	0.00	0.82	Skidtubes		imlby
110	CNC Bend Skidtubes	1 pcs	11/29/17	11/29/17	0.00	1.00	CNC Bend Skidtube		m66
120	QC	1 pcs	11/29/17	11/29/17	0.00	0.00	QC5		BE
130	CNC Vertical Machining	1 pcs	11/29/17	11/29/17	2.21	1.00	HAAS 1		Kt 17-12-08
140	QC	1 pcs	11/29/17	11/29/17	0.00	0.00	QC2		Kt 17-12-08
150	Mill Conv	1 pcs	11/29/17	11/29/17	0.00	0.27	Mill Conv 1		J.L.L. 17-12-11
160	QC	1 pcs	11/29/17	11/29/17	0.00	0.00	QC2		J.L.L. 17-12-11
170	QC	1 pcs	11/29/17	11/29/17	0.00	0.00	QC8		AP 17/12/11
180	Skidtubes	1 pcs	11/29/17	11/29/17	0.00	0.82	Skidtubes		AP 17-12-12
190	QC	1 pcs	11/29/17	11/29/17	0.00	0.00	QC5		AP 17-12-12
200	HandFinish	1 pcs	11/29/17	11/29/17	0.00	0.33	HandFinish1		BE 17/12/16
210	QC	1 pcs	11/29/17	11/29/17	0.00	0.00	QC7		AP 2017/12/20
220	Skidtubes	1 pcs	11/29/17	11/29/17	0.00	0.82	Skidtubes		AP 17-12-21
230	QC	1 pcs	11/29/17	11/29/17	0.00	0.00	QC5		2017-12-21
235	HandFinish	1 pcs	11/29/17	11/29/17	0.00	0.33	HandFinish2		2017-12-21
241	Spray Paint	1 pcs	11/29/17	11/29/17	0.00	0.99	Spray Paint		2017-12-21
250	QC	1 pcs	11/29/17	11/29/17	0.00	0.00	QC14		AP 17-12-27
254	HandFinish	1 pcs	11/30/17	11/30/17	0.00	0.33	HandFinish4		
256	QC	1 pcs	11/30/17	11/30/17	0.00	0.00	QC5		
260	Packaging	1 pcs	11/30/17	11/30/17	0.00	0.00	Packaging3		
280	QC21-SA	1 Ea	11/30/17	11/30/17	0.00	0.00	QC21		

Part Op 100 - Cut as per dwg.

Descriptions: 110 - Bend as per Dwg D3391 Using Bend Prog 3391021 **6.75**

130 - 1-Machine as per Folio FA590 Rev. ____ & Dwg D3391 Rev. ____

150 - Drill X1 Aft cap as per Dwg D3391 .1875" dia

180 - 1-Drill Remaining two holes for tow cap using DT 8819 Locating off of .1875" holes drilled in previous step 2-Drill float bag holes as per Dwg D3391 using DT8798(Do not open tow cap holes to finish size) (ONLY DRILL HOLES MARKED "A") 6-Deburr & Scribe Batch number Inside aft end. 7-Transfer drill D3391-021 with D3391-023

220 - 1-instal spacers as per dwg D3391 A/R Magnabond 6398 batch: **1137712** exp. date: **2018/01** cure time 12hrs. as per QSI015 2- grind crossbolt flush 3-back drill crossbolt if necessary

235 - AND REALODINE AS PER QSI 005

DART
AEROSPACE
S017267

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Hawkesbury, ON K64 1K7
CANADA
TEL.: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com



Fwd Tube Assembly

PART NO:
Revision:
Operation:
Change No:

D3391-021

Start up Operation

Mfg Date: 12/05/17
Job No: 168617-B

Job Allocations

Operation	Component Part	Required	Inventory	Allocated	Std Qty
90-Start up Operation	D6013-047 <i>B80064</i>	1	63	0	0
220-Skidtubes <i>8165393</i>	D3670-4-200 <i>5165393</i>	4	78	0	0
254-HandFinish <i>FM135998-2</i>	AELS-1032-225 <i>ALSH</i>	10	0	0	0
	AN3C4A <i>5000532</i>	10	1,343	0	0
	D3401-041 <i>F159541</i>	1	11	0	0
	D3672-1 <i>F150074</i>	4	1,741	0	0
	D4095-051 <i>5003672</i>	1	40	0	0
	NAS1149C0332R	10	3,709	0	0
	<i>FM138409-1</i>				

Part Specifications

Specifications could not be found.

Plex 11/20/17 10:10 AM dart.lacelle.linda

INSPECTION SHEET

DAS 1

Engineering Approval:
(If necessary)

Rev	Date	Change	Revised by	Approved
A	06.04.27	New Issue P/O D3391-011/-021	KJ/JLM	
B	06.06.19	Tolerances revised per D3391 Rev. E	KJ/JLM	
C	07.03.21	Dimensions removed per Dwg rev. F	KJ/JLM	
D	07.11.23	Dwg Rev. updated	KJ/EC/DD	
E	09.12.14	Dwg Rev updated	KJ	
F	11.06.21	Dimension 0.500 added	KJ	
G	12.05.15	Dwg Rev updated	KJ	
H	16.06.23	Dimensions updated per Dwg Rev J	KJ	

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor Approval Verification		
			QC / QA Coordinator Approval		
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐			FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐		
OTHER : _____					

INSTALL D3670-4200 SPACER
SEAL WITH MAGNOBOND 6398
GRIND FLUSH
PRIOR TO PAINTING
4 PL

DETAIL B



INSTALL
AELS-1032-225
AFTER FINISH
10 PL

D4095-051
WEARSHOE

AN3C4A BOLT
NAS1149C0332R WASHER
6 PL

D3391-021 FWD TUBE ASSEMBLY ASSEMBLY DETAIL

SEAL WITH
SIKAFLEX-241/-291



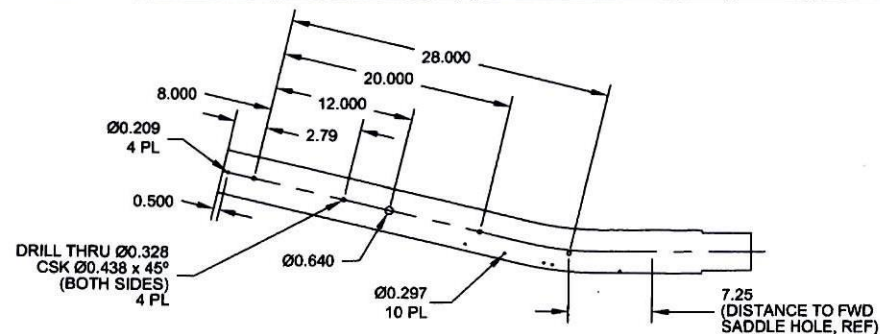
D3401-041
TOW CAP

AN3C4A BOLT
D3672-1 WASHER
NAS1149C0332R WASHER
4 PL

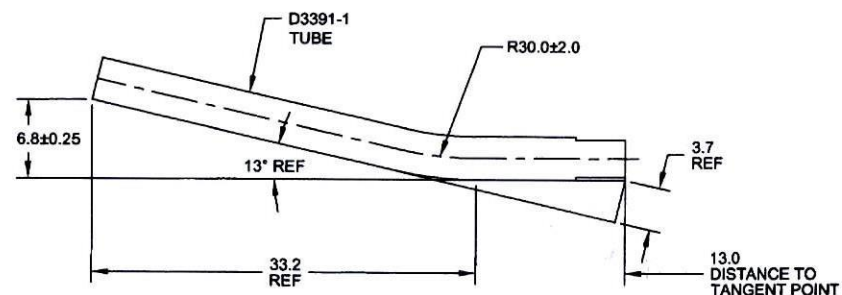
DETAIL B SCALE 2X

D3391-021 FWD TUBE ASSEMBLY PARTS LIST

QTY -021	PART NUMBER	DESCRIPTION
X	D3391-021	FWD TUBE ASSEMBLY
1	D3391-1	TUBE
1	D3401-041	TOW CAP
4	D3670-4200	SPACER
4	D3672-1	WASHER
1	D4095-051	WEARSHOE
10	AELS-1032-225	INSERT
10	AN3C4A	BOLT
10	NAS1149C0332R	WASHER



D3391-021 DRILLING DETAIL



D3391-021 BENDING DETAIL (MAKE FROM D3391-1)

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
WITHOUT NOTICE
WORK ORDER
NO. 168617B
MLC
1711-20

RELEASED
2016-04-28

DESIGN	PH	DART AEROSPACE USA, INC	
DRAWN	ML	EUGENE, OR	
CHECKED	CP	DRAWING NO.	REV. J
MFG. APPR.	DP	D3391	SHEET 4 OF 11
APPROVED	CP	TITLE	SCALE
DE APPR.	DP	412 FLOAT SKIDTUBE	NTS
DATE	16.01.14	COPYRIGHT © 2005 BY DART AEROSPACE USA, INC	
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DQA: _____ Date: _____

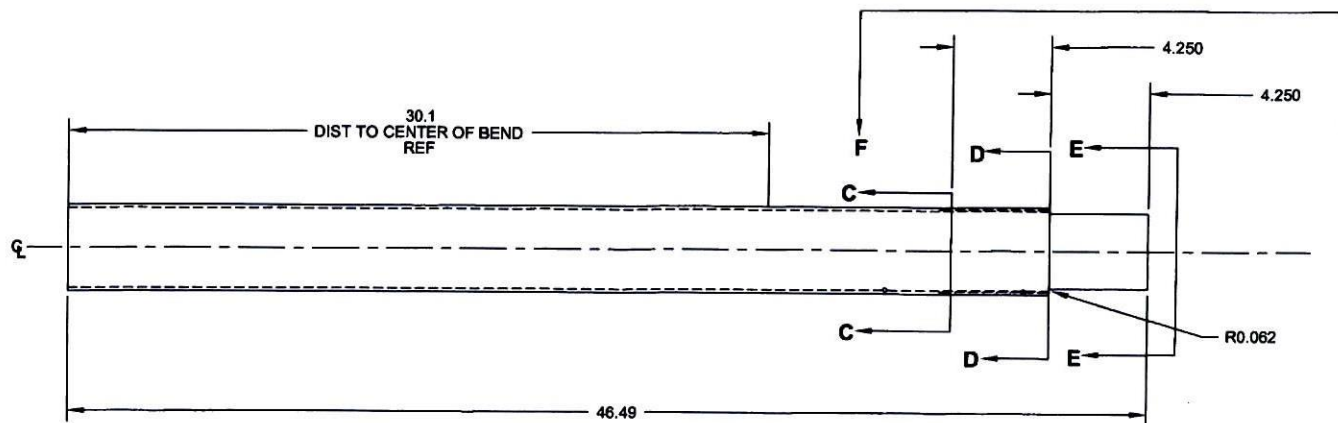


WORK ORDER NON-CONFORMANCE / UPDATE

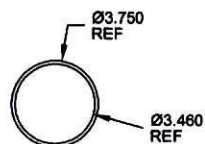
QA Closed: _____ Date: _____

Work Order update only ☐

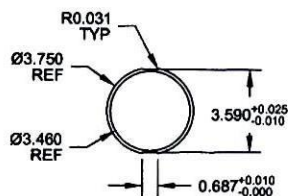
Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐		Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐					
		OTHER : ☐							



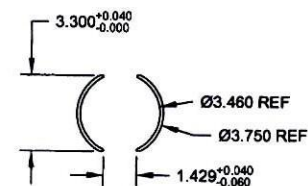
D3391-1 TUBE
(MAKE FROM D6013-047 SKIDTUBE MATERIAL)



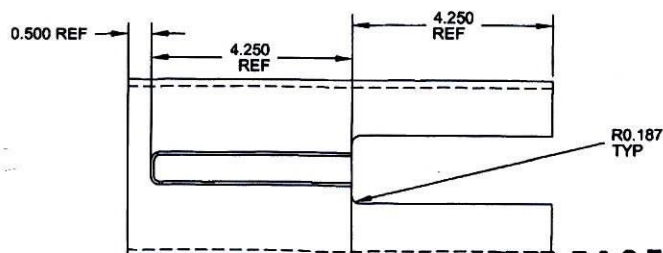
SECTION C-C



SECTION D-D



SECTION E-E



VIEW F-F
SCALE 2X

RELEASED
2016-04-28

DESIGN	PH	DART AEROSPACE USA, INC	
DRAWN	ML	EUGENE, OR	
CHECKED	CP	DRAWING NO.	REV. J
MFG. APPR.	22	D3391	SHEET 5 OF 11
APPROVED	22	TITLE	SCALE
DE APPR.	22	412 FLOAT SKIDTUBE	NTS
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DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QS1042) Approval		
Description Work Order Deviation				Disposition				Completed By	
								Lead hand / Supervisor Approval Verification	
								QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____							
Misidentified ☐	Past Due ☐								